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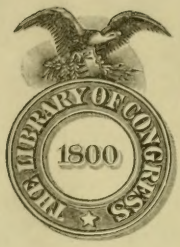

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THE HISTORY OF THE COWPEA AND ITS INTRODUCTION INTO AMERICA.

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THE HISTORY OF THE COWPEA AND ITS INTRODUCTION INTO AMERICA.[a]

INTRODUCTION.

The purpose of this paper[b] is to give a brief history of the introduction of the plant known as the cowpea (*Vigna unguiculata*) into America, to establish as nearly as possible the time at which it was introduced, and to ascertain the region to which it is native.

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[a] Although the cowpea is the chief leguminous crop of the southern United States, the most diverse and often erroneous ideas prevail in regard to its geographic origin and the time and means of its introduction into American agriculture. It has been maintained by some, for example, that it is a native of tropical America; by others, that it was brought from Africa by the negro slaves, and by still others that it was introduced by the United States Department of Agriculture.

Because of the bearing of the question on certain introduction and breeding experiments with cowpeas, Mr. A. J. Pieters, then in charge of the seed introduction and distribution work of the Department, started an inquiry into the subject, intrusting the work to Mrs. K. S. Bort, who made extensive extracts from the literature of cultivated plants. So many questions arose, however, requiring the consideration of a botanist trained in the critical discrimination of plants and with a wide knowledge of botanical literature, that Mr. W. F. Wight was assigned to the task. He has made a thorough investigation of the history of the cowpea, and in the accompanying paper has brought forward proofs of the principal points in that history, namely, that the cowpea is a native of the Afghanistan region; that it was introduced into the West Indies over two hundred years ago, and that it subsequently was brought to the American mainland, gradually extending northward until, about 1797, it reached the latitude of the Potomac and attracted the attention of such a keen agriculturist as Washington himself.—Frederick V. Coville, *Botanist in Charge of Taxonomic Investigations.*

[b] The author wishes to acknowledge his indebtedness to Mr. Frederick V. Coville for Latin and Greek translations and for many suggestions; to the Chinese Legation for translation from the Chinese; to Mr. S. Stefansson, of the Library of Congress, for translation of Arabic; and to Mr. C. M. Mansfield, of the Bureau of Plant Industry, for photographs.

The conclusions which have been drawn are, briefly, that it was introduced into the West Indies during the latter half of the seventeenth century and probably reached the mainland during the first half of the eighteenth century; that it is a native of India and the region northwestward to the southern part of the trans-Caspian district; that its cultivation in that region is of ancient date; that its cultivation extended to China at a very early period; that it was known in Arabia and Asia Minor as early as the beginning of the Christian era, and was cultivated in at least one of the countries of southern Europe at about the same time, but that its introduction into central Europe was of much later date and entirely independent of its introduction into southern Europe.

HISTORY.

The nativity of several economic plants that have been in cultivation for a very long period is extremely difficult of determination. This difficulty is especially great in the case of the cowpea (*Vigna unguiculata*), because of its similarity to some other leguminous plants likewise in cultivation for several centuries, and the vague way in which these plants were described or alluded to by early authors.

It is evident from the statements of these authors that more than one bean-like plant was in cultivation in southern Europe before the discovery of America. It may be inferred also that at least one of these plants bore a close resemblance to the common or kidney bean[a] (*Phaseolus vulgaris*), since this species was introduced into Europe without apparently receiving the attention that a plant more unlike any known to them would have attracted. The statements regarding the origin of maize, for instance, are much more definite than those concerning the species of beans. Many of the botanical authors who wrote during the century following the discovery of America and the introduction of American species into Europe, like their predecessors, sought to identify the beans cultivated at the time they wrote with the bean-like plants described by Theophrastus and Dioscorides. This tendency is doubtless at least partly responsible for their failure to distinguish clearly the species then cultivated. De Candolle, in the "Origin of Cultivated Plants," while doubting the identity of *Phaseolus vulgaris* with any of the plants known to the ancients, after discussing the origin of the words applied to *P. vulgaris* in several European languages, says (p. 339): "Nevertheless,

[a] In this paper the expression "the common bean" is not used to designate any particular one of the many garden varieties of *Phaseolus vulgaris*, but is applied to all the forms of the species. The term "kidney bean" is used by the English and "haricot bean" by the French in the same sense.

the *dolichos* of Theophrastus has been definitely referred [by other authors] to the *scarlet runner* [*Phaseolus coccineus* (*P. multiflorus* Lam.)], and the *fasiolus* to the dwarf haricot [*Phaseolus vulgaris*] of our gardens * * * . I can only say it may be so." Again (p. 347): "*Lobion* in Dioscorides is the fruit of *Ph. vulgaris*, at least in the opinion of commentators."

De Candolle, however, apparently did not examine very carefully the evidence of the American origin of these plants. The early accounts of discovery in America contain references to leguminous plants which indicate that they were extensively used by the natives of the New World.

Hariot, 1588, "A Brief and True Report of the New Found Land of Virginia," mentions two kinds: One, "Okindgier, called by us *Beanes*, because in greatness and partly in shape they are like to Beanes in England; saving that they are flatter, of more divers colours, and some pide. The leafe also of the stemme is much different." The other plant, "Wickonzowr, called by us *Peaze*, in respect of the beanes for distinction sake, because they are much less; although in form they little differ; but in goodness of taste much, and are far better than our English peaze." Captain John Smith, 1612 (Workes, 62), writes: "They plant also pease they cal Assentamens, which are the same they cal in Italye, *Fagioli*. Their Beanes are the same the Turkes cal Garnanses, but these they much esteeme for dainties."[a] The same author, 1616 (Works, 207), in a description of New England, mentions "beans and pease" among the "hearbes and fruits," but gives no descriptions. Josselyn, 1675 (Voyages, 73–74), distinguished four kinds of beans or peas, "French beans; or, rather American beans. The herbalists call them kidney-beans, from their shape and effects; for they strengthen the kidneys. They are variegated much—some bigger, a great deal, than others; some white, black, red, yellow, blue, spotted; besides your *Bonivis*, and *Calavances*, and the kidney-bean that is proper to Ronoake. But these are brought into the country; the others are natural to the climate." Lawson, 1714 (History of Carolina, 130, 131), mentions several kinds of "pulse" as "bushel bean," "Indian rounceval, or miraculous peas," "bonavis," "calavancies," and "nanticokes." He also says "the kidney beans were here before the English came, being very plentiful in the Indian corn fields." Brickell, 1737 (Natural History of North

[a] Gray and Trumbull, 1883, American Journal of Science, 26: 132, think these names are confounded. "*Garvance* was the French name of the Chick Pea (*Cicer arietinum*), the Spanish *garbanzo;* and it is not probable that the 'Turks' gave this name to any kind of beans; while *fagiuoli* was the Italian equivalent of Latin *phaseoli*. Strachy's Virginian vocabulary gives *assentamens* (and otassentamens) for 'pease,' and *peccatoas, peketawes,* for 'beans.'"

Carolina, 16, 17), describes the beans of the country in the following language:

There are several sorts of Pulse in this Province; and first, the *Bushel Bean*, so called from producing a Bushel of Beans or more from one that is Planted; they are a Spontanious product in *Carolina*, and are Set in the Spring round Arbours, or near long Poles set in the Ground for that purpose, where they make a good Shade to sit under in the extremity of hot Weather; they continue Budding, Flowering, and Ripening all the Summer, until the approach of Frost, which prevents their farther Growth, and so dye; They climb prodigious high, and their Stalk is about the thickness of a Man's Thumb, the Pod grows like the *Kidney Bean*, but the Bean is flat, white, or mottled, with a purple Colour: They are extraordinary good, and well relished Pulse, either by themselves or with Meat.

The *Indian Rouncival*, or *Miraculous Pea*, so called from their long Pods and great Increase. These are a late Pea, and require a pretty long Summer to ripen and bring them to Perfection, they are a good Pulse, and in great plenty all over this Province with *Christians* and Indians.

The *Bonavis* is another kind of *Pulse*, and yields a great Increase, it doth not require so long a Summer to ripen as the former, they grow like *Kidney-Beans*, and are very plenty in this Province.

The *Calivances* are another kind of *Pulse*, resembling the former, but are not so flat, they are in great plenty in most of the Plantations amongst the Indian Corn. These and the *Bonavis*, afford two Crops in the Year, and are generally ripe and in full perfection in six Weeks time.

The *Nanticoacks* are another kind of *Pulse*, and resemble the *Calivances*, and are in great plenty all over this Province.

There are several other kinds of *Pulse* in this Province that we have no Name for, which are well known amongst the *Indians*, and are excellent Food.

The *Kidney-Bean*, is likewise here in great plenty growing for the most part in every Corn-Field. The Indians had these four Sorts of *Pulse*, *viz.* the *Bonavis*, *Calivances*, *Nanticoacks*, and *Kidney-Beans*, and several other sorts, long before the Arrival of the *Europeans* amongst them; which Report I have had affirmed several times, not only from the *Christians*, but likewise from the *Indians* in these Parts.

These references and many others given by Gray and Trumbull, 1883 (American Journal of Science, 26: 130–138), and by Sturtevant, 1887 (American Naturalist, 21: 327–331), certainly justify those authors in the conclusion that *Phaseolus vulgaris*, *P. coccineus*, and *P. lunatus* are natives of the New World. Koernicke, 1885 (Verhandl. Nat. Hist. Rhein. & Westphal. Correspondenzblatt, 136), also arrived at the same conclusion in regard to *P. vulgaris*. The recent discovery of seeds identified as *P. vulgaris* in the remains of the mound builders in Ohio and of the cliff dwellers in New Mexico[a] affords evidence additional to that presented by the above authors of the nativity of that species. But among all the references given there is no positive evidence that any species of Dolichos or Vigna was in cultivation by the Indians for at least a hundred years after

[a] Wittmack, 1905, Trans. Acad. Sci. St. Louis, 15: 14.

the first English settlement. The authors of the eighteenth century record a greater number of legumes than the authors of either the sixteenth or seventeenth centuries, and there are frequent references in the literature of that period to the introduction of seeds from the Old World. Not a single species of Dolichos is known except in a cultivated state in North America north of Mexico, and Hemsley does not enumerate any in the Biologia Centrali-Americana. Only one species of Vigna, *V. repens*, now found spontaneous throughout the Tropics, has the appearance of being indigenous to either North or Central America, while about 10 species of Phaseolus are known in a wild state in North America, and Hemsley enumerates 41 in the Biologia Centrali-Americana for Central America.

The time at which important American food plants were introduced into England is also significant in regard to the origin of these plants. The following dates are given on the authority of Aiton (Hortus Kewensis, 1789): *Zea mays* was cultivated in 1562; *Nicotiana tabacum* before 1570, but the exact date is apparently not known; *Lycopersicon lycopersicum* was cultivated in 1596; *Phaseolus vulgaris* in 1597, and *P. coccineus* (*P. multiflorus* Lam.) in 1597. The date given for *P. lunatus* is 1779, but the figure and description of Gerard's third kind (Gerard, 1597, Herbal, 1039), correspond very closely to the so-called sieva type of *P. lunatus*, and it is possible that it had been introduced at an earlier date and, not meeting with favor, disappeared, but there is no evidence that *Vigna unguiculata* and *Dolichos sesquipedalis* were introduced into England before 1776 and 1781, respectively. With one possible exception, therefore, plants of undoubted American origin were cultivated in England more than a century and a half before *Vigna unguiculata* or *Dolichos sesquipedalis*. This would scarcely have been the case if the two last-named species had been cultivated in America for a long period, as the first-named were.

Of the two kinds distinguished by Hariot in 1588, the one called "Peaze" is without doubt the kidney bean, as it is called "Peaze, * * * for distinction sake * * * though in form they little differ" from the bean except in size. The latter is compared with the English bean (*Vicia faba*) in size and partly in shape, and is either a large form of kidney bean or the Lima bean. If the words "Fagiole" and "Garnanses" or garvanses are confounded by Smith, the "pease" which he mentions probably refers to a species of Lathyrus or Vicia, and the "Beanes" to the common kidney bean. There can be little doubt that "Garnanses" is a corruption of the Spanish *garbanzo*, French *garvance*. It has also been written "garavance," "garvancos," and "gravances." The writer has been unable to find

this word used in Europe for any other plant than the chick-pea (*Cicer arietinum*), and although the introduction of seeds into America began as early as the second voyage of Columbus, it is improbable that the cultivation of the chick-pea could have been introduced among the Indians of the United States as early as 1612, and it is doubtful whether it was ever cultivated by them.

There is no evidence that it was cultivated to any extent by the colonists, though it was introduced some time previous to 1790. The name was probably applied by Smith to some plant with a superficial resemblance to the chick-pea, perhaps a vetch. There is at least no evidence that the plant called "garnanses" was a species of either Vigna or Dolichos. The name "calivance" was applied by Sloane, 1707 (Natural History of Jamaica, 1: 183), to the cowpea, and this word is believed to be a corruption of "garbanzo." The forms given in Murray (English Dictionary, under Calavance) are, "garvance," "caravance," "callavance," "callevance," "callvanse," "kalavansa," "callivancy," "callivance," "calavance." The earliest use of the word "calavance" that the writer has been able to find is by William Hughes, 1672 (The American Physician, or a Treatise of the Roots, Plants, Trees, Shrubs, Fruit, Herbs, etc., 17, 18), where he writes concerning "Calavance, or Calavances:"

> These Pease have long and small stalks, of a brownish green colour, branched and spread upon the ground (unless they be supported by Props) much after the same manner of our Field-pease; the leaves shoot forth at several places, set one against another, of a more yellowish green colour than ours in *England* are: They have also towards the top, clasping Tendrils, as ours have: The Cods are pretty long, wherein are small Pease of the bigness of our Vetches, but long; or of the fashion of a Kidney-bean, and very smooth; outwardly, of a dark red colour; neither are they uneven when they be dry.
>
> They grow in many places in *America*, as in *Jamaica*, at Colonel *Barington's* Plantations, at Ligance, at Portamorant, etc.
>
> They are planted at any time, and flourish all the year; of which the Husbandmen or Planters there, have five crops in two years.
>
> Some call them the *Indian Vetches*, some the *Indian Pease;* but those that are Inhabitants there, call them *Calavances*, or *Calicvancie*.

The plant described by Hughes is certainly a plant with pinnate leaves and tendrils, like the chick-pea, but Sloane, 1696 (Catalogus Plantarum Jamaica, 71), cites "Calavance or calavances of Hughes, p. 17 (?)," under *Phaseolus erectus major*, which is a cowpea. The same author, 1707 (Natural History of Jamaica, 1: 183), under *Phaseolus erectus major*, says "Callavance Jamaicensibus dictus," without any indication of doubt. It would appear from these facts that the word was originally used in America to designate a vetch-like plant and that its application to the cowpea by Sloane was an error. Several authors subsequently adopted Sloane's usage of the

name, and it is preserved at the present day in the form "galavant" as the name of one of the varieties of the cowpea.

The four kinds mentioned by Josselyn, 1675 (Voyages, 73–74), are "kidney-beans," "bonivis," "calavances," and the "kidney-bean that is proper to Ronoake."

Bonivis is clearly a corruption of Italian *Buona vista*, and Hughes, 1750 (Natural History of Barbadoes, 216), writes "*Buona Vista*, commonly called *Bonny-vis*." Its earliest use in America appears to be by Richard Ligon, 1657 (A True and Exact History of the Island of Barbadoes, 22, 24), "Maies, and Bonavists, planted between the boughs, the Trees lying along upon the ground; so far short was the ground then of being cleared." No description is given by which the name can be identified with a particular species, and its application can only be inferred from its later use by other authors. Sloane, 1696 (Cat. Pl. Jam., 67, 68), and 1707 (Nat. Hist. Jam., 1:177), uses bonavist for *Dolichos lablab*. The "Buona vista" of Hughes, 1750 (Nat. Hist. Barbadoes), is also certainly *Dolichos lablab*. Wherever the word "bonavist" in its various forms occurs with an identifiable description it refers to *Dolichos lablab*. Josselyn's "calavances," like that of William Hughes, is probably a plant with pinnate leaves. Certainly no variety of *Vigna unguiculata* then known would mature seeds in New England. The "kidney-bean that is proper to Ronoake" may be either the Lima bean, the scarlet runner, or one of the numerous varieties of the kidney bean.

The "bushel bean" of Lawson is probably *Phaseolus lunatus*. Sturtevant, 1885 (Amer. Nat., 19:454), has suggested that the "Indian rounceval, or miraculous peas," may have been *Dolichos sesquipedalis*, but it would have been more natural for an Englishman to have applied the term to a plant more nearly resembling the English rounceval. Lawson's "bonavis" is doubtless *Dolichos lablab*, but "calavancies" and "nanticokes" are scarcely identifiable, though the latter is probably one of the various forms of the kidney bean. Brickell gives nearly the same description of bushel bean and Indian rounceval as found in Lawson; in fact, the wording is so familiar that it is without much doubt copied from the earlier author. There is less doubt, however, regarding the "Calivances" of Brickell. They resembled the bonavis, except that they were not so flat. This clearly refers to some other plant than a Vicia or Lathyrus, and though it can not be identified from the descriptions, it must be either a form of *Phaseolus vulgaris* or perhaps the red-seeded form of *Vigna unguiculata*, the "callavance" of Sloane.

Jamaica was captured by the British in 1655, and possession was confirmed by treaty in 1670. William Hughes (The American Physician, etc., published in 1672); describes several plants cultivated in

Jamaica, but does not include *Vigna unguiculata*, his calavance, as noted above, being a different plant. If *Vigna unguiculata* had been cultivated in Jamaica at that time it would probably have been mentioned with the other cultivated legumes Hughes described. Sloane visited the island in 1687, remaining fifteen months, and found both the red and white seeded forms, and it is therefore very probable that they reached Jamaica some time between the years 1672 and 1687. Any plant that had been found valuable in Jamaica would no doubt soon be tried in the southern colonies, for the early accounts of the colonies indicate that they frequently obtained seeds of new plants for trial. The Georgia colony even sent a man to the Spanish West Indies to secure new plants (Francis Moore, 1744, A Voyage to Georgia, Georgia Historical Society, 1840, 1:99). It is therefore possible that even the calavance of Lawson, 1714, is *V. unguiculata*. The statement of Brickell, 1737 (Natural History of North Carolina), that these plants were in America before the arrival of the Europeans can scarcely be taken seriously, for he makes it on the authority of the settlers and Indians who would easily confuse plants so similar in appearance as *Vigna unguiculata* and *Phaseolus vulgaris*. The exportations of peas mentioned by some of the early historians probably refer to English peas, as Lawson, 1714 (Hist. Carolina, 130, 131), says English peas "have been made trial of" and "yield very well."

The first unmistakable reference to the occurrence of *Vigna unguiculata* on the mainland of America appears in Romans (1775), Natural History of East and West Florida, 122, where the author says: "Pease, as they are here called but improperly, because species of the *Phaseolus* and *Dolichos* are meant, follow the maize in utility. It is well known that most people use them like European pease either green or dry, and some kinds, such as the small white sort, the bonavist, cuckolds increase, the white black-eyed pea, the white crowder, and many others, are undoubtedly at least as good." The "small white sort" is doubtless a white variety of the common bean; bonavist probably refers to *Dolichos lablab*. "Cuckolds increase" is applied by Patrick Brown, 1756 (Natural History of Jamaica, 292), to a species which he says resembles his seventh species, "Phaseolus erectus major," Sloane, which is *Vigna unguiculata*. Lunan, 1814 (Hortus Jamaicensis, 1:434), says the "cuckolds increase" "seems to be a species of *dolichos*, as does the bonavist." The white black-eyed pea is undoubtedly identical also with the black-eyed pea of Jamaica, another common form of *Vigna unguiculata*. The "white crowder" does not appear to be described by either Sloane or Brown. With the exception of the "small white sort" and the "white crowder" the names given by Romans were also given by Brown nineteen years earlier, and by Lunan thirty-nine years later, and the fact that

the names "calavance," "bonavist," "cuckolds increase," and "black-eyed pea" all appear in the natural history literature of the West Indies earlier than they occur in the accounts of the American colonies indicates that they came from the West Indies to the mainland. Lunan, 1814 (Hortus Jamaicensis, 1: 167), under "Dolichos" says: "Besides the above indigenous species, three exotic ones have been introduced, the lablab, of which arbours are made in the East; the *sinensis*, or Chinese dolichos; and the catjang, which is said to be cultivated for food in the East Indies."

The discussion given by Romans indicates that "pease" had been grown in the southern colonies for several years, long enough at least for their use to become "well known." In Virginia, however, there is evidence that *Vigna unguiculata* was not cultivated, at least to any extent, at so early a date. The correspondence of Washington affords interesting evidence of this fact. A letter dated Hyde-Park, Fairfax County, November 18, 1791, in reply to a circular letter sent out by Washington (Letters on Agriculture to Arthur Young and Sir John Sinclair, edited by Franklin Knight, 51, 1847), contains the following statement:

> As to pease, beans, potatoes, and turnips, our lands yield them very well, but as they are not raised for market in general I can not say what may be their average product per acre. It has ever appeared to me that if the farmers in Europe, who lay so much stress upon these articles in their writings, had our excellent substitute for them, Indian corn, they would only regard them as we do, for culinary purposes.

Washington was accustomed to growing seeds of new plants that might prove of agricultural value, and there are frequent references in his correspondence to seeds which had come from England or other countries and of which he wished the gardener to take particular care. The following are mentioned in Washington's correspondence, besides the staple crops of corn, wheat, etc.: Lucern, sainfoin, India hemp, buckwheat, furze, flax, white bent-grass, everlasting peas, and English field peas.

It was Washington's practice, sometimes, at least, to plant potatoes with corn, since in a rotation of crops recorded in "George Washington and Mount Vernon," edited by M. D. Conway, 287, 1889, "Indian corn, with intermediate rows of potatoes, or any root more certain or useful (if such there be) that will not impede the plough, hoe, or harrow in the cultivation of the corn," is given for one crop of the rotation. There is apparently no reference in any letter of Washington to the cultivation of peas or beans with corn. He used buckwheat as a green manure.

The first reference by Washington to the cowpea is in a letter to Landon Carter, of Cleve, dated Philadelphia, 27th February, 1797,

in which he says: " I hope, as the season is approaching fast when the ground should be prepared for it, that you have informed Mr. James Anderson (my manager) in a letter directed to the care of the postmaster in Alexandria, at what time he may send for the peas you were so obliging as to promise me;" and the following from a letter of James Anderson to Landon Carter, which accompanied the above letter of Washington. " I have only to add to that wrote by the President—that the sooner you have 40 bushels of the White Indian pease, with black eyes—ready, you will the more oblige the President, I do not wish any of the small kind either the round kind called the Gentlemen pease, nor of the other small kind which resemble the large."

Jefferson, 1801 (Notes on the State of Virginia), makes no mention of peas or beans, although he enumerates the cultivated plants (p. 58), saying—

> Our farms produce wheat, rye, barley, oats, buckwheat, broom corn, and Indian corn. The climate suits rice well enough, where the lands do. Tobacco, hemp, flax, and cotton, are staple commodities. Indigo yields two cuttings. The silk-worm is a native, and the mulberry, proper for its food, grows kindly.
>
> We cultivate also potatoes, both the long and the round, turnips, carrots, parsnips, pumpkins, and ground nuts (Arachis). Our grasses are lucerne, St. foin, burnet, timothy, ray and orchard grass; red, white, and yellow clover; greensward, blue grass, and crab grass.
>
> The gardens yield musk-melons, water-melons, tomatos, okra, pomegranates, figs, and the esculent plants of Europe.

Beans and peas are not mentioned, and it may therefore be inferred that neither was at that time of sufficient importance in northern Virginia to be listed among the farm crops. A legume, probably *Vigna unguiculata*, was, however, cultivated in the cornfields to some extent in southern Virginia some years earlier than the publication of Jefferson's Notes.

Dr. James Greenway, of Dinwiddie County, Va., in an article on *Cassia chamaecrista* as a soil renovator (Transactions of the American Philosophical Society, 3:226, 1793), says the " common cornfield-pea is far preferable to everything that I have seen tried for this purpose. Every farmer who leaves his pea vines on the ground, and does not in the accustomed manner, pull them up for fodder, must often have observed that they quickly moulder and fall to pieces; furnishing a covering to the ground, which readily unites and blends with it, in the manner mentioned of the bean " [i. e., *Cassia chamaecrista*].

A catalogue of the plants found growing near Lancaster, Pa., by Muhlenberg, 1793 (Transactions of the American Philosophical Society, 3: 157), in which cultivated and introduced plants are given, as well as wild plants, does not mention any Dolichos or Vigna. The cowpea evidently had not then reached that locality.

It may be seen from the facts presented that there is no evidence that *Vigna unguiculata* was one of the native beans of America. On the contrary, it appears to have been first introduced into Jamaica at some time between 1672 and 1687 and to have reached one or more of the southernmost colonies, probably from Jamaica, sometime after the latter date, but before 1737, and its use to have extended gradually northward until it reached the Potomac about 1790 or 1795.

Notwithstanding the confusion wrought by commentators seeking to identify *Phaseolus vulgaris* with one of the climbing plants of Theophrastus and Dioscorides, European botanical literature affords very convincing evidence of the Old World origin of *Vigna unguiculata.*

Phaseolus vulgaris appears to have reached central Europe about 1536, and many authors at once identified it with Dioscorides's Smilax kepaia, or, as translated into Latin, Smilax hortensis. The species is discussed by Brunfels, 1536 (Herb. Viv. Ic., 3: 130), and identified on the authority of Heironymus Tragus with Dioscorides's plant. Brunfels in his Exegesis omnium simplicium Dioscorides (Brunfels,[a] 1532, Herb. Viv. Ic., 2: 114), does not identify Smilax more than to say that, according to Barbarus, it is a kind of phaseolus, and it is evident that *Phaseolus vulgaris* was not known to this author when volume 2 of his work was written. Bock, 1546 (Kreuterbuch, 236), has a good colored figure of the kidney bean, and says it has lately come into Germany.

Matthiolus, 1588 (Opera, 341), says that phasioli are common in Italy, but he apparently confuses the dwarf form of *Phaseolus vulgaris* with the " phasiolus " of the ancients. No stipules are shown in his figure, and it is probably *Phaseolus vulgaris.* In the earlier editions of Matthiolus's works, which appeared while the author lived in Italy and southern Austria, no bean with " black-eyed " seeds is described among the various sorts of " phasiolus." In a later work, Matthiolus, 1565, Commentarii, 429, the dedication of which was written at Prague, and dated January, 1565, seeds with a black ring about the eye are described, but the figure is the same as in the work issued in 1558. In Camerarius's edition of Matthiolus, 1586 (De plantis epitome utilissima, 212), however, the figure of phaseolus is *Vigna unguiculata.* It is certain that a low-growing leguminous plant, resembling the dwarf form of *Phaseolus vulgaris*, was cultivated in the Mediterranean region of southern Europe before the discovery of America. Several of the ancient treatises on agriculture give cultural directions for such a plant. Many, if not all, of the

[a] The edition of this work published in 1536 was the one consulted.

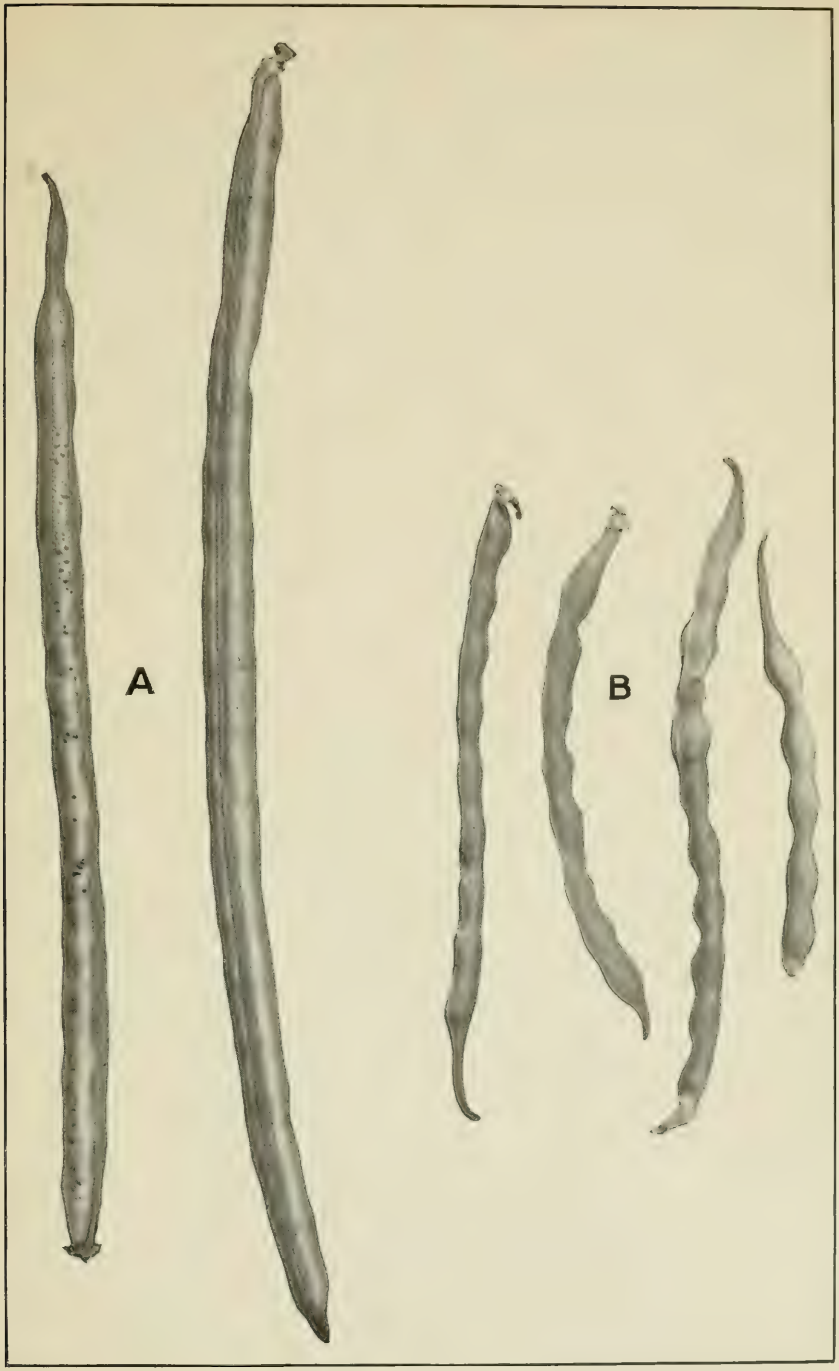
botanical authors after Dioscorides mentioned phaseolus, and Albertus Magnus, who lived in the thirteenth century, used the word "faselus" for a plant which had seeds with "a black spot at the hilum." Caesalpin, 1583 (De Plantis, 238), also described "phaselus" as having seeds with a black pupil.

Koernicke, 1885, Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande, Westfalens und des Reg.-Bezirke Osnabrück, Correspondenzblatt, 136, maintains that the phaseolus of Dioscorides and the phaseolus cultivated in Italy before the discovery of America were the same species, "*Vigna sinensis*," and that the "Smilax kepaia" of Dioscorides was likewise that species, but a climbing form. Koernicke states that a work of the year 1415, by Rinio, a Venetian physician, contains a colored illustration of "Faseolus," and he identifies this as *Dolichos melanopthalmus* DC. He says also that in both Codices of Dioscorides of the fifth century after Christ, which illustrate the plant named phaseolus, the figures are likewise the low form of *Vigna unguiculata*, while for Smilax kepaia an illustration is wanting. Koernicke, however, believes *Dolichos melanopthalmus* DC., *D. monachalis* Brot., *D. lubia* Forsk., *D. sesquipedalis* L. to be low forms, and *D. catjang* L., D. *sinensis* Stickman, and *D. tranquebaricus* Jacq. to be climbing forms of the same species. Baker, 1879 (in Hook. Fl. Brit. India, 2:206), gives *V. sinensis* as the climbing and *V. catjang* as the low form. Koernicke says that the variation in the seeds is not greater than in *Phaseolus vulgaris*, and that dried plants in the Berlin Herbarium show no specific differences. *Vigna sinensis* (*Dolichos sinensis* Stickman) on the basis of priority is adopted by Koernicke as the correct name of the species, but he apparently overlooks the fact that *Dolichos unguiculatus* L. (*Vigna unguiculata* (L.) Walp.) is still earlier. Koernicke gives central Africa as the original habitat of the species. *Dolichos sesquipedalis*, the asparagus bean, is considered a distinct species by most authors, and the writer can not agree with Koernicke that all the other names apply to the same species or that central Africa is the home of any of them. It is true that the habit of growth, whether low or a climbing form, is of no specific value, for *Vigna unguiculata* at least seems to vary in this respect.

The color of the seeds likewise fails as a distinguishing specific character. *Dolichos unguiculatus* L. was founded on specimens grown in the garden at Upsala, but came to Linnæus from Barbados. *Dolichos sinensis* was based on *Dolichos sinensis* or *Katjang Sina* of Rumphius, and the figure in Rumphius Herbarium Amboinense shows a climbing plant with two-flowered racemes and pendulous pods. *Dolichos catjang* is likewise based on a species of Rumphius, *Phaseolus minor* or *katjang poeti*. The figures of this

PLANT OF VIGNA CATJANG (BURM.) WALP.

PLANT OF VIGNA UNGUICULATA (L.) WALP.



PODS OF COWPEAS.

A.—*Vigna unguiculata.* B.—*Vigna catjang.*

(Natural size.)

species shows a plant with the racemes two or three flowered, but with the pods at maturity smaller and erect, or nearly so, and with smaller seeds. A species grown in the greenhouses of the United States Department of Agriculture shows similar characters, the pods remaining erect until full grown, although they become pendent at maturity. The pods are also conspicuously torose at maturity. This species is *Vigna catjang* (Burm.) Walp. (Pl. I and Pl. III, B). Practically all of the varieties commonly cultivated in America belong to *Vigna unguiculata* (L.) Walp. (*V. sinensis* (Stickman) Endl.), the species with larger seeds and larger pods which usually become pendulous when half their mature size or sometimes even earlier, and which are only slightly constricted between the seeds (Pl. II, and Pl. III, A). Forskal, 1775 (Fl. Aegypt-Arab., 133), described *Dolichos lubia* as having peduncles racemosely spicate at the apex and the flowers crowded, and it may therefore be inferred that the racemes were several-flowered. The pods were described as erect. The color of the seeds is not mentioned by Forskal, but Delile, 1812 (Plant. Cult. en Egypt, 14), says they were white, with a black point at the eye. Koernicke says the "ring about the navel is pale red," and the seeds labeled *D. lubia*, recently received from the Muséum d'Histoire Naturelle, Paris, are quite small, red, with a black ring at the hilum. The varieties of *Vigna unguiculata* commonly cultivated in America seldom vary from the few-flowered character of the raceme and, at maturity, pendulous pods. Delile says *Dolichos lubia* is known also in Syria, Persia, and India, but there is but one other modern author who has applied the name to any species in Asia. Basiner, 1848 (Beitr. Russ. Reich., 15:233), gives *Dolichos lubia* as one of the forage plants of Khiva, where it was known as "Lobia" or "Lobi." No description is given, and therefore its identity with Forskal's plant is not certain.

The fact that Delile says it was found also in India, but does not mention any species of Vigna, suggests that his plant may have been *Vigna unguiculata* or *Vigna catjang*. Roxburgh, 1832 (Fl. Ind., 3: 302), described *Dolichos sinensis* as with peduncles "many-flowered," and *D. catjang*, few-flowered. Baker, 1879 (Hook. Fl. Brit. Ind., 2:206), unites the two as *V. catjang* and says peduncles 3 to 6 flowered. Baker, 1871 (Oliver, Fl. Trop. Afric., 2:204), describes the racemes of *Vigna sinensis* as 6 to 12 flowered and the pods pendulous. It appears, therefore that the few-flowered character of the raceme usually observed in varieties cultivated in America is not constant in either *Vigna unguiculata* or *Vigna catjang*. The descriptions cited above indicate a variation of from 3 to 12 in the number of flowers, and the plant described by Forskal as *Dolichos lubia*, since it had erect pods, is doubtless identical with *V. catjang*. Yet, not-

withstanding the variation in habit and number of flowers in the raceme, the small seeds and small, erect pods of *Vigna catjang* appear to be constant characters, and two species, *Vigna unguiculata* (*V. sinensis*) and *V. catjang*, therefore are probably concerned in the descriptions of these plants by the above authors.

It is quite possible that *Vigna unguiculata* and *V. catjang* may have been grown by the Romans without being distinguished. The cultivation and even knowledge of them, however, appears to have been extremely limited in Europe, and *V. unguiculata* at least may have first reached central Europe not from Italy, but by way of Russia and Russian Turkestan.

In 1583 Clusius (Atrebatis Rar. Stirp., 725) described and figured a plant as a kind of phaseolus which is undoubtedly *Vigna unguiculata*, though pods are not shown in the figure. Seeds of this plant were received by Clusius at Vienna in the year 1576, having been sent by Dodoens from Prague, where it was grown in the garden of the castle the previous year. The following year, 1577, seeds of the same plant were also sent by the Spaniards to the Austrian Emperor. These statements are repeated by Clusius, 1601 (Hist. Rar. Pl., p. cexxii), where the same figure, as in the previous work, is reversed and a figure of the pods in addition is given. It would appear from these records that *Vigna unguiculata* first became known to the botanists of central and northern Europe by its being grown at Prague.

If seeds had reached Prague from Italy, the plant would probably have been known also at Vienna, which was in the route of trade from Italy northward, and, since Prague is an inland city, the seeds may have been brought overland directly from Persia or India. So long as the Venetians were in control of the trade with India, Austria and southern Germany carried on commerce with Venice. With the acquisition of the Indian trade by the Portuguese, Venice could no longer supply the markets of Europe with the products of the East and European nations apparently soon became jealous of the advantages held by Portugal, for it is stated by Robertson, 1802 (Historical Disquisition Concerning India, 319), that an attempt was made, in order to diminish the advantages which the Portuguese derived from the discovery of a sea passage around the Cape of Good Hope, to induce the Russians to convey Indian and Chinese commodities through their Empire to some port on the Baltic from which they might be distributed through every part of Europe. This author also gives a brief account of the trade thus established. Yeats, 1872 (The Growth and Vicissitudes of Commerce, 155), states that Kazan was the chief entrepôt of the trade of northern and central Asia. Russian trade with other European nations ap-

pears to have been confined largely to the countries of the north and the cities belonging to the Hanseatic League. Very little seems to have been written concerning the commerce of Prague, but the Bohemians are a Slavic people and it is not improbable that they had some trade with the other Slavic peoples of Europe. At least no explanation of the occurrence of *Vigna unguiculata* at Prague before it was known at Vienna seems so plausible as that it came by one of the caravan routes to Russia and thence to Prague. De Candolle (Origin of Cultivated Plants, 39) says *Sium sisarum* "came perhaps from Siberia into Russia, and thence into Germany," and inclines to the view that it was not known to the ancient Greeks and Romans. This species is considered to be a native of the Altai region of Siberia and northern Persia. The caravan route from India and China to Russia passed through the latter region.

The figure in Rinio, 1415 (De Simplicibus), referred to by Koernicke, the writer has not seen, but in the Vienna Dioscorides Codex, dating from about the fifth century, the figure of the plant supposed to be the phasiolus of Dioscorides shows a several-flowered raceme. It also shows what appear to be mature pods and, while not strictly erect, they are not pendulous like those of *Vigna unguiculata*. The word "lubia" is written in Arabic on the parchment and the figure corresponds very closely with the description of *Dolichos lubia*. Forskal says the latter species was known among the Arabs as "*Lubia baeledi*" (common lubia). Dioscorides was probably born at Anazarba, a place in southeastern Asia Minor near the eastern extremity of the Mediterranean, but he is supposed to have traveled and it is not known where the plants he described may have been seen.

Koernicke believes the species to have come originally from central Africa, as it grows wild there. This, however, is not necessarily conclusive. There are other instances, especially in the Tropics, of plants appearing indigenous to countries in which they are known not to be native. The facts given by Koernicke indicate rather that the species has been introduced into central Africa, for he gives no name in the native language, but says it is known to the natives by the Arabian names "lubiah" and "ollaich." Seeds of this plant have never been found in the monuments of ancient Egypt, and the origin of the word "lubia" indicates that the plant to which it was applied came into Arabia and Egypt from the east. Lubia, lubiya, or lobiya probably was not derived from the Greek word λοβός, which primarily means any projection like the lobe of the ear, but appears to be of Persian origin and came to India through the Persians. Sir George Watt, 1890 (Dict. Econ. Prod. India, 3: 184), says: "No name like *lobiya* is given to any pulse by the aboriginal races of Indian or by those of Aryan origin. It occurs purely among the

people of upper India, where Persian influence is most pronounced." The same author states that in all the districts of the northwest provinces, with but one possible exception, the word lobiya is applied to *Vigna catjang*.

Although none of the Indian works consulted that mention lubiya are of such ancient date as Dioscorides, they nevertheless indicate the antiquity of its cultivation in India. *Vigna catjang*, the species with erect pods, is described and figured in Rheede, 1688 (Hort. Malabar, 8:75. *t. 41*), under the name *paeru*. It is interesting to note that the root nodules were mentioned in this work, "The root is slender, whitish, and fibrous, the fibers clothed with round globules." Rheede described nine different preparations of the seed which were used in medicine. Other bean-like plants occur in the same work under the names *putsja-paeru* and *catu-paeru*, which indicates that the paeru was better and probably longer known than the plants to which compound names were given. In a work, Ain-i-Akbari or Ayeen Akbery (Institutes of the Emperor Akbar), written in Persian during the reign of the Emperor Akbar, 1556–1605, describing the crops grown in Delhi and Agra, translated by Francis Gladwin, 1783, 1:87, "lubya" is given as one of the crops of the autumnal harvest. Sir George Watt states that at the present time this would be *Vigna catjang*, and in all probability would have been the same in Akbar's time. Sir George Watt gives nearly 50 vernacular names in different Indian languages, of which only four are compound words and only four others consist of more than one word. One of the Sanskrit names given by Watt is *nishpáva*. In the Vishnu Purana, lib. 1, cap. 6, supposed to date from about 1045 A. D. (translation by Horace Wilson, Complete Works, 6:95), "Nishpáva, a sort of pulse," is mentioned in the list of important grains. This work is five hundred years later than the illustration in the Vienna Dioscorides Codex. Nevertheless, Sanskrit for two thousand years or more has led an artificial existence, being the means of communication and literary expression of the priestly and learned castes, and the writer finds no indication that the name nishpáva has ever been applied to any other plant.

The species appear to be probably of less ancient cultivation in China, for there is no indication of a Chinese introduction into India or Persia, and it is improbable that the same species would be native on both sides of such a natural barrier as the Himalayas. Nevertheless, *Vigna unguiculata* at least appears to have been long cultivated in China. It is mentioned and illustrated in the second edition of the Kiu Huang Pen Ts'ao, which appeared in 1559. In this work it is called the "common bean," and other beans are compared with it. It has not been practicable to consult the first edition of this work, pub-

lished in the beginning of the fifteenth century, and whether it appears there or not is uncertain.

It may be noted that no plant of American origin has been identified in any Chinese work previous to the Pen Ts'ao Kang Mu, which was finished in 1578, though not published until after 1596.

It may be concluded from the facts so far known regarding these species that both *Vigna unguiculata* and *V. catjang* originally came from a region including and extending from India to Persia and the southern part of the Trans-Caspian district, and that the Persians called one or both of them by the name "lubia" and applied that name to *V. unguiculata* in northwest India after their conquest of that region. The cultivation of *V. unguiculata* extended to China at a very early date, but the distribution of at least one of the species with the name "lubia" had extended from the region of its origin at the beginning of the Christian era to Arabia and Asia Minor and had reached some of the Mediterranean countries of Europe at about the same time, but did not become known in central Europe until the middle of the sixteenth century.

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